

since they find ironwood bark to their liking, the gummy exudate present under the upraised seeds is also attractive to them. If this is true, their activity in searching out and collecting the gum might be serviceable to the tree, since it would be highly effective in breaking loose both seed and radicle. This possibility of rodent activity in conjunction with seeds is at present, however, purely conjectural. It may be of interest to note that a white rat found the seeds very distasteful, even though they had been macerated and combined with egg yolk.

An interesting study in the relative effectiveness of birds in the distribution of mistletoe is available to residents in desert areas where the parasite exists. This effectiveness would depend on three factors: use of the fruit for food; abundance of the species; habits of the species, that is, behavior subsequent to eating the fruit.

In the following comment the birds are mentioned in the probable order of their importance as distributors of mistletoe seed in Borego Valley. *Phainopepla*, a voracious feeder on mistletoe, is the most abundant species feeding on the plant. Furthermore, its perching habits are adapted most admirably to the role of seed distributor. Bluebirds feed on the fruit of the mistletoe and are moderately abundant during the fruiting winter months; their perching habits facilitate the dispersal of seed. Desert quail feed on the fruit voraciously. They are abundant throughout the fruiting period, but after eating, they return to the ground so are less important as effective distributors. Moreover, during feeding, these birds knock off large numbers of berries and frequently break loose whole twigs. In addition to these species which are most important in the economy of the parasite, others such as robins and thrashers might be mentioned but upon these few observations are available. Until continuous and more careful observations are made, any statement as to the value of many of the birds to the mistletoe would be purely conjectural.

University of California, Los Angeles,
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PLANTS DESCRIBED ORIGINALLY FROM CRATER LAKE NATIONAL PARK

F. LYLE WYND

The following is a list of the plants known to have been described originally from Crater Lake National Park. The author studied these plants during several seasons at the Park.

BOTRYCHIUM PUMICOLA Coville, Underw. Nat. Ferns, ed. 6. 69. 1900. Growing in pumice soil on the summit of Llao Rock, Crater Lake, Oregon, at an elevation of about 9000 feet, *Coville*

and *Applegate*, 1898. A very rare plant, known only from the type locality. The vernation is erect in the sterile segment, the stems sheathed with remnants of earlier growth.

SCIRPUS CONGDONI Britton var. *MINOR* Henderson, *Rhodora* 32: 21. 1930. Along a creek, Mackenzie Pass, Oregon, *Henderson* 7108; Pole Bridge Creek, Crater Lake Park, *Wynd* 1769. Known only from the type locality and from Crater Lake Park. The variety differs from the species in its lower stature, and shorter rays.

CAREX CAMPYLOCARPA Holm, *Am. Jour. Sci.* ser. 4, 20: 304. Figs. 13-15. 1905. Crater Lake National Park, Cathedral Spring, *Coville* 1457. This species resembles *C. scopulorum*, but differs in having distinct marginal denticulations on the perigynium and a more slender habit. It is found in the mountains of western Washington and Oregon.

SILENE MONTANA Wats. var. *viscida* Henderson, *Rhodora* 32: 25. 1930. Dry woods, Crater Lake Park, Oregon, in high Canadian Zone, *Wynd* 2357. The variety differs from the species in being finely glandular. Known only from Crater Lake Park, where it is common throughout the Canadian Zone.

ARENARIA PUMICOLA Coville and Leiberg, *Proc. Biol. Soc. Wash.* 11: 169. 1897. Crater Lake, Oregon, at an altitude of 2180 meters, *Coville and Leiberg* 349. This plant is very similar to *A. aculeata* Wats. and is doubtfully consistently separable from it. In general, Crater Lake material has the leaves more erect and either blunt or very short-pointed, while those of *A. aculeata* Wats. are definitely sharp-pointed. The nerves of the calyx are less pronounced in the Crater Lake form. Very common at Crater Lake. Its range, as represented by specimens in the United States National Herbarium, extends through northeastern California.

RANUNCULUS GORMANI Greene, *Pittonia* 3: 91. 1896. On moist banks at Cathedral Springs, Crater Lake, August 22, 1896, *Gorman*. This plant has been collected in the mountains from the Three Sisters in Oregon to the Klamath Mountains in California. It is a small creeping species, common in wet places.

RANUNCULUS TERRESTRIS Wynd, *Torreyia* 30: 53. 1930. Red Blanket Creek, in the southwest corner of Crater Lake National Park, *Wynd* 2086. This form is to be included in *R. Gormanii* Greene as a synonym.

RANUNCULUS OCCIDENTALIS Nutt. var. *dissectus* Henderson, *Rhodora* 32: 25. 1930. Near Pole Bridge Creek, dry slopes of Crater Lake Park, Oregon, *Wynd* 2221. The variety has deeply cleft to divided radical leaves. Material has also been collected in Klamath, Cook, and Lake counties, Oregon.

CARDAMINE BELLIDIFOLIA L. var. PACHYPHYLLA Coville and Leiberg, Proc. Biol. Soc. Wash. 11: 170. 1897. Crater Lake, Mount Mazama, Oregon, at an altitude of 2300 meters, *Coville and Leiberg 426*. The variety occupies a range geographically contiguous to the western arm of the southern montane extension of the circumpolar species, namely the Cascade Mountains of southern Oregon and northern California.

ARABIS WYNDII Henderson, Rhodora 32: 25. 1930. Crater Lake Park, Oregon, *Wynd 2322*. This plant resembles *A. pulchra* Jones, but differs in having furcate hairs toward the base of the plant. The upper part of the stem and the leaves are glabrous, the leaves ciliate; the capsules are glabrous. Western botanists have referred this species to *A. hastulata* Greene and to *A. Holboellii* Hornem. It is especially common in the yellow pine forests of Crater Lake Park and about the Klamath Lakes.

ARABIS HORIZONTALIS Greene, Leaflets Bot. Obs. and Crit. 2: 74. 1910. Crater Lake, Klamath County, Oregon, *Coville and Applegate 334*. This species is a synonym of *A. Lemmoni* Wats.

ARABIS DIANTHIFOLIA Greene, Leaflets Bot. Obs. and Crit. 2: 76. 1910. Crater Lake Park, southern Oregon, *Coville 1511*. This is a synonym of *A. suffrutescens* Wats.

RIBES ERYTHROCARPUM Coville and Leiberg, Proc. Biol. Soc. Wash. 10: 132. 1896. At an altitude of about 1675 meters, in the canyon of Pole Bridge Creek, about ten kilometers south of Crater Lake, Cascade Mountains, Oregon, August 12, 1896, *Coville and Leiberg*. A very distinct species, separable from *R. laxiflorum* Pursh and *R. Howellii* Greene by its creeping habit and its glandular pubescence. This is one of the most characteristic and beautiful plants of the Hudsonian Zone. Its distribution, as indicated by specimens in the United States National Herbarium, extends only through the Park and its immediate vicinity.

LUPINUS LYALLII Gray var. FRUTICULOSUS (Greene) C. P. Smith, Bull. Torr. Bot. Club 51: 303. 1924. *L. fruticulosus* Greene, Muhlenbergia 8: 117. 1912. Klamath County, southern Oregon, Annie Creek Valley, July 31, 1897, *Coville and Applegate*. This is the most robust variety of the species, resembling *L. aridus* Dougl. It has relatively large flowers and a broad banner. Its range extends through Jackson and Klamath counties, Oregon.

OXYPOLIS OCCIDENTALIS Coulter and Rose, Contr. U. S. Nat. Herb. 7: 196. 1900. In springy meadows west of Crater Lake, Oregon, altitude 1870 meters, *Leiberg 4413*. This species resembles *O. Fendleri* (Gray) Heller, but is more robust. It is common at Crater Lake about springy places, and is found also in the Sierra Nevada Mountains of California from Tuolumne County to Tulare County.

COLLOMIA MAZAMA Coville, Proc. Biol. Soc. Wash. 11: 35. 1897. Near Crater Lake, in the Cascade Mountains of Oregon, at an altitude of 1900 meters, *Coville and Leiberg 429*. A beautiful, blue-flowered species, especially common in the swampy meadows along the western boundary of the Park. It is known only from Crater Lake Park and from Jackson County, Oregon.

CASTILLEJA APPLIGATEI Fernald, Erythea 6: 49. 1898. Summit of Mount Scott (2800 meters), Klamath County, Oregon, *Applegate 87*. The corolla is nearly three centimeters long. The galea is greenish-backed, with its upper three-fourths exerted. A handsome species known only from the Park and its immediate vicinity.

SAMBUCUS LEIOSPERMA Leiberg, Proc. Biol. Soc. Wash. 11: 40. 1897. Crater Lake, Oregon, altitude 2230 meters, *Coville and Leiberg 370*. This species is a synonym of *S. racemosa* L.

MACHAERANTHERA INOPS Nelson and Macbride, Bot. Gaz. 62: 148. 1916. On Glacier Mountain [Glacier Peak?], Oregon, in the Crater Lake region, *Walpole 2288*. A depauperate rayless perennial with fuscous pappus. The involucre bracts are minutely pubescent, obscurely or not at all glandular, linear-oblong, subacute, with some of the tips refracted. This species is known only from the type locality and its vicinity.

MACHAERANTHERA INOPS Nelson and Macbride var. *ATRATA* Nelson and Macbride, Bot. Gaz. 62: 148. 1916. Crater Lake Park, on firm pumice gravel at the summit of Llaio Rock, *Coville 1470*. The variety is like the species except that it has fewer stems and fewer but larger heads. The involucre are broadly turbinate rather than hemispherical, the bracts having either dark-purple striations or margins.

Henry Shaw School of Botany,
Washington University,
St. Louis, Missouri,
March 11, 1936.

NOTES ON ARABIS L.

REED C. ROLLINS

In the course of a study of the genus *Arabis* as it occurs naturally in the Pacific Northwest, it has frequently been necessary to consider material from adjacent areas. In doing so several items involving the change of specific or varietal units, not within the range of prescribed study, have come to my attention.

In the citation of specimens the following abbreviations are used: University of California, Berkeley (UC); Pomona College, Claremont, California (P); United States National Herbarium (US); State College, Pullman, Washington (WSC).